

**REMARKS**

This Amendment and Response to Final Office Action is being submitted in response to the final Office Action mailed November 20, 2006. Claims 15-31 are pending in the Application.

Claims 15-31 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite.

Claims 15-31 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Ye et al. (US 6,417,965) in view of Kinoshita et al. (US 2002/0001124).

Claims 15-31 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Ye et al. (US 6,417,965) in view of Kinoshita et al. (US 2002/0001124) and in further view of Zahnly et al. (US 2002/0176156).

In response to these rejections, reconsideration of the Application is respectfully requested in view of the following remarks.

**Rejection of Claims 15-31 Under 35 U.S.C. 112, Second Paragraph**

Claims 15-31 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite. Specifically, Examiner states that Claim 15 recites method limitations in an apparatus claim.

In response to this rejection, the limitations, "wherein the controlling device selectively switches back and forth between the gain threshold mode and the constant gain mode, and wherein, while operating in the constant gain mode, the gain threshold mode is re-enabled when no transient events occur during a lockout period," have been removed from Claim 15.

Therefore, Applicants submit that the rejection of Claims 15-31 under 35 U.S.C. 112, second paragraph, as being indefinite has now been overcome and respectfully request that this rejection be withdrawn.

**Rejection of Claims 15-31 Under 35 U.S.C. 103(a) –**

**Ye et al. in View of Kinoshita et al.**

Claims 15-21 and 23-30 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Ye et al. (US 6,417,965) in view of Kinoshita et al. (US 2002/0001124).

Claim 15 has been amended to recite:

15. An optical amplifying apparatus, comprising:
  - an optical amplifying device;
  - a controlling device configured for operating said optical amplifying device in one of a gain threshold mode and a constant gain mode, said controlling device further configured for switching the optical amplifying device from operating in the gain threshold mode to operating in the constant gain mode when an absolute value of a gain error exceeds a gain threshold, wherein the gain error is a difference between a target gain and a gain of the optical amplifying device, *said controlling device further configured for switching the optical amplifying device back and forth between the gain threshold mode and the constant gain mode, and said controlling device further configured for switching the optical amplifying device from the constant gain mode to the gain threshold mode when no transient events occur during a lockout period*; and
  - a measuring device configured to measure power levels on a plurality of points within said optical amplifying device including at least an input power ( $P_{IN}$ ) and an output power ( $P_{OUT}$ ) of the optical amplifying device, said measuring device also configured to communicate with said controlling device.

These amendments are fully supported in the Specification, Drawings, and Claims of the Application and no new matter has been added.

Applicants assert that neither Ye et al. nor Kinoshita et al. teach or suggest *said controlling device further configured for switching the optical amplifying device back and forth between the gain threshold mode and the constant gain mode, and said controlling device further configured for switching the optical amplifying device from the constant gain mode to the gain threshold mode when no transient events occur during a lockout period.*

Examiner states, “the device of Ye is *definitely capable of performing* the applicant’s claimed method.” (Emphasis added to distinctly point out that although Examiner states that the device of Ye et al. is “definitely capable of performing” such, Ye et al. do not teach or suggest actually performing the claimed function) Ye et al. do not teach or suggest a controlling device that is configured to switch back and forth, as necessary based upon assessed conditions, between a gain threshold mode and a constant gain mode. Ye et al. do not teach or suggest a controlling device that selectively makes a switch between these modes based on the non-occurrence of transient events during a lockout period. These deficiencies are not remedied by Kinoshita et al.

Applicants disclose and claim an optical amplifying device that switches from one mode to another, as appropriate, through the use of a gain threshold. Thus, the optical amplifying device not only switches from a gain threshold mode to a constant gain mode, as necessary based upon assessed conditions, but also switches from the constant gain mode back to the gain threshold mode. *This allows the gain threshold mode to be re-enabled. Furthermore, such switching happens back-and-forth between the modes as needed and as controlled by the controlling device. Thus, the controlling device controls the optical amplifying device to operate either in the gain threshold mode or the constant gain mode and controls switching between the.* This is not taught or suggested by Ye et al., nor is this deficiency remedied by Kinoshita et al.

Claims 16-31 are dependent claims either directly or ultimately dependent from Claim 15. Based on the same unique and novel features of the present invention as

described above, namely that Claim 15 has unique and novel features, it is respectfully asserted that these dependent claims are now in condition for allowance.

Therefore, Applicants submit that the rejection of Claims 15-31 under 35 U.S.C. 103(a) as being unpatentable over Ye et al. in view of Kinoshita et al. has now been overcome and respectfully request that this rejection be withdrawn.

**Rejection of Claims 15-31 Under 35 U.S.C. 103(a) –**  
**Ye et al. in View of Kinoshita et al. and Zahnly et al.**

Claims 15-31 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Ye et al. (US 6,417,965) in view of Kinoshita et al. (US 2002/0001124) and in further view of Zahnly et al. (US 2002/0176156).

The above arguments apply with equal force here.

Additionally, Zahnly et al. do not remedy the deficiencies in Ye et al. and Kinoshita et al. Although Examiner cites Paragraph [0049] of Zahnly et al., which is included in its entirety immediately below, Applicants assert that this text does not teach or suggest *said controlling device further configured for switching the optical amplifying device back and forth between the gain threshold mode and the constant gain mode, and said controlling device further configured for switching the optical amplifying device from the constant gain mode to the gain threshold mode when no transient events occur during a lockout period.*

[0049] Illustratively, the low gain value is normally equal to approximately one, while the high gain value is usually between 8 and 32, depending on the operating dynamic range of the input signal 201. As such, the gain switches effectively expand the dynamic range of the A/D converters. However, due to the existence of a small calibration error which can occur during the gain switching, and a gain switching time delay, the gain-switching may cause a substantial transient discontinuity (spike), discussed in more detail below. To avoid these spikes, the control

loop which includes first loop controller 234, second loop controller 235, and mixer 236 checks the input signal 201 at each sampling interval (e.g. at time (k-1), k, (k+1), etc.) to determine if it has reached the threshold for gain-switching. If the threshold has been reached, the controller will "skip" a certain number of samples. Illustratively, four samples spanning an approximately 10 .mu.s interval are skipped." (Zahnly et al.)

Zahnly et al. specifically teach "[t]o avoid these spikes, the control loop which includes first loop controller 234, second loop controller 235, and mixer 236 **checks the input signal 201 at each sampling interval (e.g. at time (k-1), k, (k+1), etc.) to determine if it has reached the threshold for gain-switching. If the threshold has been reached, the controller will "skip" a certain number of samples.**" Applicants assert that this is not the same as taking an action based on the non-occurrence of an event during a lockout period.

Claims 16-31 are dependent claims either directly or ultimately dependent from Claim 15. Based on the same unique and novel features of the present invention as described above, namely that Claim 15 has unique and novel features, it is respectfully asserted that these dependent claims are now in condition for allowance.

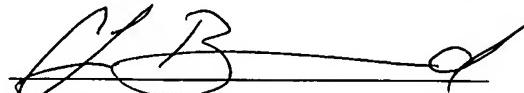
Therefore, Applicants submit that the rejection of Claims 15-31 under 35 U.S.C. 103(a) as being unpatentable over Ye et al. in view of Kinoshita et al. and in further view of Zahnly et al. has now been overcome and respectfully request that this rejection be withdrawn.

**CONCLUSION**

Applicants would like to thank Examiner for the attention and consideration accorded the Application. Should Examiner determine that any further action is necessary to place the Application in condition for allowance, Examiner is encouraged to contact undersigned Counsel at the telephone number, facsimile number, address, or email address provided below. It is not believed that any fees for additional claims, extensions of time, or the like are required beyond those that may otherwise be indicated in the documents accompanying this paper. However, if such additional fees are required, Examiner is encouraged to notify undersigned Counsel at Examiner's earliest convenience.

Respectfully submitted,

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